
Space Weather Forecast

Issued on Friday 27 December 2024 at 00:56 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Occasional Minor/Moderate (R1/R2) radio blackouts expected throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with two Moderate-class flares observed. There are currently thirteen sunspot regions on the disc, with two small regions currently unnumbered. The largest region on the disc remains AR3936 approaching north centre disc, but this still appears to have a largely straightforward magnetic structure. AR3938 in the northeast has been the most active region of late, and is showing some minor magnetic complexity. AR3928 and AR3933 in the southwest both faded a little, with both also showing a reduction in magnetic complexity. AR3932 at south centre disc has seen most of its leading spots fade. The other groups appear small and simple at this time.

There have been several large far sided Coronal Mass Ejections (CMEs) in the last 24 hours, making near sided CME analysis more difficult. No obviously Earth-directed CMEs observed in available imagery, although investigation continues into a number of features.

Solar Wind / Geomagnetic Activity: Solar winds showed a return to background conditions after the recent faster wind stream. The wind speed fell from slightly elevated levels around 430km/s to background levels around 350km/s. The Interplanetary Magnetic Field was weak throughout, with the north-south component varying weakly. Geomagnetic activity was Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: High energy proton flux (greater than 10MeV) showed a continuing gradual decline, well below the S1/Minor Radiation Storm threshold.

Four-Day Space Weather Forecast Summary

Solar Activity: Occasional Moderate flares are likely, with a slight chance of isolated Strong flares throughout.

Solar Wind / Geomagnetic Activity: The CME from 23 Dec is now considered likely to have missed Earth. Whilst no further CMEs are currently expected, there have been numerous CMEs in recent days and confidence in this aspect of the forecast is lower than usual. Solar winds have now declined to background levels after the recent fast wind stream. Wind speeds expected to remain at background or perhaps slightly elevated levels through the period in the absence of CME enhancement.

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Geomagnetic activity is expected to be mainly Quiet to Unsettled, but with a very slight risk of Active to G1/Minor Storm intervals should any glancing CME effects occur.

Energetic Particles / Solar Radiation: There is a slight chance of S1/Minor Radiation Storm or greater enhancements during the period. In the absence of any further notable flares, ongoing energetic particle counts should continue to ease towards background levels in the coming days.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	5	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	70	70	70	70
Very Active	R3-R5 (X Class)	No	10	10	10	10

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	10	10	10	15
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = cm ⁻² sr ⁻¹ s ⁻¹)						